

Cotton wool spots

DESCRIPTION

Cotton wool spots are fluffy white lesions in the retinal nerve fibre layer that represent areas of focal ischaemia and oedema. The retina has a high metabolic rate, and is highly susceptible to any disease process that restricts its arterial oxygen supply. There are many possible diseases that may manifest cotton wool spots, as shown in the table below. Consequences of retinal hypoxia include tissue oedema, occlusion of precapillary arterioles, the local accumulation of fluid and metabolic products and interruption of axoplasmic flow within the nerve fibre layer, resulting in the characteristic appearance of cotton wool spots. Eventually, the swelling may subside and nerve fibre layer micro-infarction may result.

SYMPTOMS

Cotton wool spots are asymptomatic. Symptoms may exist relating to the underlying cause, or to any ocular complications of this underlying cause.

SIGNS

Cotton wool spots appear on fundoscopy as white, fluffy lesions with hazy or feathered edges in the superficial retina. Underlying retinal vessels may be obscured.

SIGNIFICANCE

Cotton wool spots indicate significant retinal ischaemia or other disorder. The underlying cause requires identification and management.

DIFFERENTIAL DIAGNOSIS

See the table below.

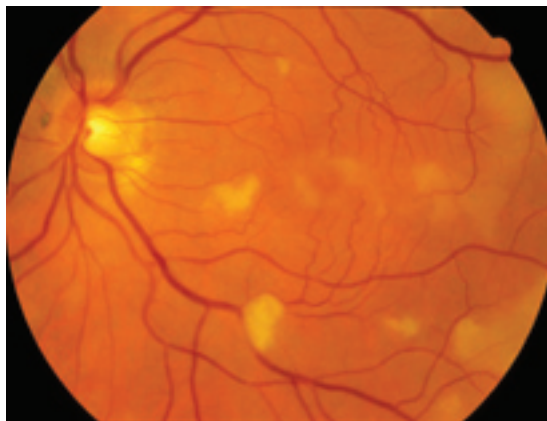


FIGURE 1. Cotton wool spots. The lesions affect the retinal nerve fibre layer, obscuring the underlying retinal blood vessels

SEE ALSO

Choroidal neovascularisation, Diabetic retinopathy, Hypertensive retinopathy, Central retinal artery occlusion, Central retinal vein occlusion, Ocular ischaemic syndrome (Ophthalmic artery hypoperfusion, Carotid occlusive disease), Lymphoma, Systemic lupus erythematosus, Acquired immunodeficiency syndrome (AIDS) Retinopathy, Cytomegalovirus retinitis, Radiation retinopathy.

MANAGEMENT

The principal objective is identification and management of the underlying condition.

Ocular tests, imaging investigations

When the cause is unknown, or when management decisions will be influenced by the results of ocular investigations (eg diabetic retinop-

athy), fluorescein angiography may be indicated. Cotton wool spots minimally block background choroidal fluorescence, appearing as dark areas on fluorescein angiography. Despite appropriate investigations, cotton wool spots may remain idiopathic in up to 5 percent of cases.

Review

After successful treatment of the underlying cause, cotton wool spots typically resolve over several weeks. Confluent areas of ischaemia may lead to neovascularisation; review should be conducted initially at routine intervals of no less than three months following cotton wool spot resolution.

The full series of these articles will be available in the book *Posterior Eye Disease and Glaucoma A-Z* by Bruce A S, O'Day J, McKay D and Swann P. £39.99. For further information click on the Bookstore at www.opticianonline.net.

- ◆ **Adrian Bruce** is a Chief Optometrist at the Victorian College of Optometry and a Senior Fellow, Department of Optometry and Vision Sciences, The University of Melbourne.
- ◆ **Justin O'Day** is an Associate Professor in the Department of Ophthalmology, The University of Melbourne and Head Of Neuro-Ophthalmology Clinic, Royal Victorian Eye and Ear Hospital.
- ◆ **Daniel McKay** is a Medical Officer at the Royal Victorian Eye & Ear Hospital.
- ◆ **Peter Swann** is Associate Professor in the School of Optometry, Queensland University of Technology.

Common causes of retinal ischaemia

Pathological process	Examples
Microvascular disease	Diabetic retinopathy, hypertensive retinopathy
Occlusive vascular disease	Retinal artery and vein occlusions, ophthalmic artery hypoperfusion
Hematological disease	Anaemia, leukaemia, lymphoma
Collagen vascular disease	Systemic lupus erythematosus
Thrombo-embolic disease	Cardiac valvular disease, severe trauma
Infections	Human immunodeficiency virus, cytomegalovirus
Iatrogenic retinal damage	Radiation retinopathy